

THE IMPACT OF PREOPERATIVE ANXIETY ON ANESTHETIC REQUIREMENTS AND RECOVERY TIMES: A PROSPECTIVE OBSERVATIONAL STUDY

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Abstract

Background: Preoperative anxiety is a common issue that may influence anesthetic requirements and recovery outcomes. This study aims to investigate the impact of preoperative anxiety on anesthetic dosage and recovery times. **Materials and Methods:** A prospective observational study was conducted with 100 patients undergoing elective surgery. Patients were divided into low anxiety (n=50) and high anxiety (n=50) groups based on their State-Trait Anxiety Inventory (STAI) scores. The induction dose of propofol and maintenance dose of sevoflurane were recorded. Recovery times, including time to extubation and post-anesthesia care unit (PACU) stay, were measured. Postoperative pain scores and analgesic consumption were also documented. Patient satisfaction was assessed using a 0-10 scale. **Results:** Patients with high preoperative anxiety required significantly higher doses of propofol (2.5 ± 0.4 mg/kg) and sevoflurane ($2.2 \pm 0.3\%$) compared to the low anxiety group (2.1 ± 0.3 mg/kg and $1.8 \pm 0.2\%$, respectively; $p < 0.01$). Recovery times were longer in the high anxiety group, with mean time to extubation at 14.7 ± 3.4 minutes and PACU stay at 58.3 ± 10.2 minutes, compared to 10.4 ± 2.1 minutes and 45.6 ± 8.7 minutes in the low anxiety group ($p < 0.01$). High anxiety patients also reported higher pain scores (5.8 ± 1.4 vs. 4.2 ± 1.1 ; $p < 0.01$) and required more morphine (14.1 ± 3.2 mg vs. 10.3 ± 2.5 mg; $p < 0.01$). Overall satisfaction was lower in the high anxiety group (6.5 ± 1.3 vs. 8.2 ± 1.0 ; $p < 0.01$). **Conclusion:** Higher preoperative anxiety is associated with increased anesthetic requirements, prolonged recovery times, higher postoperative pain, increased analgesic consumption, and lower patient satisfaction. Addressing preoperative anxiety could improve perioperative care and patient outcomes.

INTRODUCTION

Preoperative anxiety is a common phenomenon among patients awaiting surgery, characterized by feelings of apprehension, fear, and nervousness. It is estimated that up to 80% of surgical patients experience some degree of anxiety prior to their procedure. This anxiety can be attributed to various factors, including fear of the unknown, concern about postoperative pain, and potential complications. The presence of preoperative anxiety has been shown to have significant implications for both anesthetic management and postoperative recovery. Previous studies have suggested that anxious patients may require higher doses of anesthetic agents to achieve

adequate sedation and anesthesia, potentially leading to increased risk of anesthetic complications. Additionally, heightened anxiety levels can adversely affect recovery times, leading to prolonged extubation times and extended stays in the post-anesthesia care unit (PACU).

Moreover, anxiety has been associated with increased postoperative pain perception and greater consumption of analgesics, which can complicate pain management strategies and negatively impact patient satisfaction. Given these potential adverse effects, it is crucial to understand the relationship between preoperative anxiety and its impact on anesthetic requirements and recovery outcomes.

This prospective observational study aims to investigate the effects of preoperative anxiety on

anesthetic dosage, recovery times, postoperative pain, and overall patient satisfaction. By identifying the extent to which anxiety influences these variables, we hope to provide insights that could inform the development of interventions to mitigate anxiety and improve perioperative care.

MATERIALS AND METHODS

Study Design and Setting: This prospective observational study was conducted at the Government Medical College, Ananthapuram, a tertiary care institution serving a diverse population. The study period spanned from July 2022 to December 2022.

Participants

A total of 100 patients scheduled for elective surgery were recruited for the study. Inclusion criteria were patients aged 18 to 70 years who were classified as American Society of Anesthesiologists (ASA) physical status I or II. Exclusion criteria included patients with known psychiatric disorders, chronic pain conditions, or those on chronic opioid therapy.

Preoperative Anxiety Assessment

Preoperative anxiety levels were assessed using the State-Trait Anxiety Inventory (STAI). Patients were categorized into two groups based on their anxiety scores: low anxiety (STAI score ≤ 40) and high anxiety (STAI score > 40). Each group consisted of 50 patients.

Anesthetic Management

All patients underwent standardized anesthetic protocols. Induction of anesthesia was performed using propofol, and the dose required for induction was recorded. Maintenance of anesthesia was achieved with sevoflurane, and the concentration of sevoflurane used was documented.

Data Collection

Induction Dose of Propofol: The amount of propofol (mg/kg) administered during induction.

Maintenance Dose of Sevoflurane: The concentration of sevoflurane (%) used during maintenance of anesthesia.

Recovery Times: Time to extubation (minutes) and duration of stay in the post-anesthesia care unit (PACU) (minutes).

Postoperative Pain: Pain intensity was measured using a Visual Analog Scale (VAS) ranging from 0 to 10 at one hour postoperatively.

Analgesic Consumption: Total morphine consumption (mg) in the first 24 hours postoperatively.

Patient Satisfaction: Overall satisfaction was assessed using a 0-10 scale.

Statistical Analysis

Data were analyzed using descriptive and inferential statistics. Continuous variables were expressed as

mean \pm standard deviation (SD) and compared using independent t-tests. Categorical variables were compared using chi-square tests. A p-value of < 0.01 was considered statistically significant.

Ethical Considerations: The study was conducted in accordance with ethical guidelines and standards. Informed consent was obtained from all participants. The study protocol was reviewed and necessary prior permissions taken from concerned authorities.

RESULTS

Demographics and Baseline Characteristics

The study included a total of 100 patients, divided equally between the low anxiety group (n=50) and the high anxiety group (n=50). The mean age of the participants was 45.3 years (SD ± 12.4 years), with a nearly equal gender distribution of 52 males and 48 females (Table 1). There were no significant differences in baseline demographics between the two groups.

Anesthetic Requirements

Patients in the high anxiety group required a significantly higher induction dose of propofol, with a mean dose of 2.5 mg/kg (SD ± 0.4) compared to 2.1 mg/kg (SD ± 0.3) in the low anxiety group (p < 0.01). Similarly, the maintenance dose of sevoflurane was higher in the high anxiety group, with a mean dose of 2.2% (SD ± 0.3) compared to 1.8% (SD ± 0.2) in the low anxiety group (p < 0.01) (Table 2).

Recovery Times

Recovery times were significantly longer in the high anxiety group. The mean time to extubation was 14.7 minutes (SD ± 3.4) in the high anxiety group, compared to 10.4 minutes (SD ± 2.1) in the low anxiety group (p < 0.01). Additionally, the mean PACU stay was 58.3 minutes (SD ± 10.2) for the high anxiety group, versus 45.6 minutes (SD ± 8.7) for the low anxiety group (p < 0.01) (Table 3).

Postoperative Pain and Analgesic Consumption

Patients with higher preoperative anxiety reported significantly higher postoperative pain scores and required more analgesics. The mean pain score in the first hour postoperatively was 5.8 (SD ± 1.4) in the high anxiety group, compared to 4.2 (SD ± 1.1) in the low anxiety group (p < 0.01). The high anxiety group also had higher morphine consumption in the first 24 hours postoperatively, with a mean of 14.1 mg (SD ± 3.2) compared to 10.3 mg (SD ± 2.5) in the low anxiety group (p < 0.01) (Table 4).

Patient Satisfaction

Overall patient satisfaction was lower in the high anxiety group. The mean satisfaction score was 6.5 (SD ± 1.3) in the high anxiety group, compared to 8.2 (SD ± 1.0) in the low anxiety group (p < 0.01) (Table 5)

Table 1: Demographics and Baseline Characteristics

Characteristic	Low Anxiety Group (n=50)	High Anxiety Group (n=50)	Total (n=100)
Mean Age (years)	45.1 \pm 12.3	45.5 \pm 12.5	45.3 \pm 12.4
Gender (M/F)	26/24	26/24	52/48

Table 2: Anesthetic Requirements

Parameter	Low Anxiety Group (n=50)	High Anxiety Group (n=50)	p-value
Induction Dose of Propofol (mg/kg)	2.1 ± 0.3	2.5 ± 0.4	< 0.01
Maintenance Dose of Sevoflurane (%)	1.8 ± 0.2	2.2 ± 0.3	< 0.01

Table 3: Recovery Times

Parameter	Low Anxiety Group (n=50)	High Anxiety Group (n=50)	p-value
Time to Extubation (minutes)	10.4 ± 2.1	14.7 ± 3.4	< 0.01
PACU Stay (minutes)	45.6 ± 8.7	58.3 ± 10.2	< 0.01

Table 4: Postoperative Pain and Analgesic Consumption

Parameter	Low Anxiety Group (n=50)	High Anxiety Group (n=50)	p-value
Pain Score (VAS 0-10)	4.2 ± 1.1	5.8 ± 1.4	< 0.01
Morphine Consumption (mg)	10.3 ± 2.5	14.1 ± 3.2	< 0.01

Table 5: Patient Satisfaction

Parameter	Low Anxiety Group (n=50)	High Anxiety Group (n=50)	p-value
Overall Satisfaction (0-10)	8.2 ± 1.0	6.5 ± 1.3	< 0.01

DISCUSSION

This study aimed to evaluate the impact of preoperative anxiety on anesthetic requirements, recovery times, postoperative pain, and patient satisfaction in a diverse population undergoing elective surgery at a tertiary care institution. The findings indicate that higher preoperative anxiety is significantly associated with increased anesthetic requirements, prolonged recovery times, higher postoperative pain scores, greater analgesic consumption, and lower overall patient satisfaction.

Anesthetic Requirements

Our study demonstrated that patients with high preoperative anxiety required significantly higher doses of both propofol for induction and sevoflurane for maintenance of anesthesia compared to those with low anxiety levels. These findings are consistent with previous research, which suggests that anxiety can increase sympathetic nervous system activity, thereby raising the metabolic rate and altering the pharmacokinetics and pharmacodynamics of anesthetic agents. The need for higher doses of anesthetics in anxious patients underscores the importance of assessing and managing preoperative anxiety to optimize anesthetic care.

Recovery Times

Patients with higher preoperative anxiety exhibited significantly longer recovery times, as evidenced by increased time to extubation and extended stays in the post-anesthesia care unit (PACU). This prolonged recovery may be due to the higher anesthetic doses required, which can delay the metabolism and elimination of the drugs. Additionally, anxiety can exacerbate the physiological stress response to surgery, further impeding recovery. These results highlight the necessity of implementing strategies to reduce anxiety to improve recovery outcomes.

Postoperative Pain and Analgesic Consumption

The study found that higher anxiety levels were associated with significantly higher postoperative pain scores and greater morphine consumption.

Anxiety has been shown to heighten pain perception by enhancing the sensitivity of pain pathways and reducing pain tolerance. Consequently, anxious patients may require more analgesics to achieve adequate pain control, posing challenges for postoperative pain management. Addressing preoperative anxiety could therefore be a crucial step in reducing postoperative pain and minimizing analgesic use.

Patient Satisfaction

Overall patient satisfaction was significantly lower in the high anxiety group, suggesting that anxiety adversely affects the overall perioperative experience. Lower satisfaction scores may be attributed to the increased pain, prolonged recovery times, and higher anesthetic requirements experienced by anxious patients. Enhancing patient satisfaction is essential for improving clinical outcomes and patient adherence to postoperative care instructions. Therefore, integrating anxiety reduction interventions into preoperative care protocols could significantly enhance patient satisfaction.

Clinical Implications

The findings of this study underscore the importance of routine assessment and management of preoperative anxiety. Interventions such as preoperative counseling, cognitive-behavioral therapy, and pharmacologic anxiolytics could be beneficial in reducing anxiety levels and improving perioperative outcomes. Further research is needed to explore the most effective strategies for managing preoperative anxiety and to evaluate their impact on clinical outcomes.

Limitations

This study has several limitations. First, the sample size was relatively small, and the study was conducted at a single institution, which may limit the generalizability of the findings. Additionally, anxiety levels were assessed only preoperatively, without accounting for intraoperative and postoperative anxiety fluctuations. Future studies with larger, multicenter cohorts and longitudinal anxiety

assessments are warranted to validate these findings and explore the dynamic nature of anxiety across the perioperative period.

CONCLUSION

In conclusion, this study demonstrates that higher preoperative anxiety is associated with increased anesthetic requirements, prolonged recovery times, higher postoperative pain, greater analgesic consumption, and lower patient satisfaction. Addressing preoperative anxiety is crucial for optimizing perioperative care and improving patient outcomes. Implementing comprehensive anxiety reduction strategies should be considered an integral part of preoperative care protocols in surgical practice.

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